



Hereby submits this

Underground Injection Control
Request for Modification

Permit ID VAS2D970BRUS
Well Number AW114ACV

U.S. EPA Region 3
Russell County, Virginia



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

NOV 01 2018

Robert Staton
CNX Gas Company, LLC
627 Claypool Hill Mall Road
Cedar Bluff, VA 24609

RE: Application for Permit Modification; Underground Injection Control Permit No. VAS2D970BRUS;
CNX Gas Company, LLC Well No. AW114ACV

Dear Mr. Staton,

On September 12, 2018, the U.S. Environmental Protection Agency (EPA) received a request from CNX Gas Company, LLC (CNX) to modify the Underground Injection Control (UIC) permit for a Class IID brine disposal injection well in Russell County, Virginia – permit identification number VAS2D970BRUS. We have since started to review the request for inclusion of two additional injection zones, the Big Lime and the Lower Maxon, in the permit. In order to adequately evaluate the modification request, several areas require clarification. Please submit the following:

- Updated well construction diagram and description;
- Updated Area of Review including any new production wells; intake and discharge structures; hazardous waste treatment, storage, or disposal facilities; wells, springs and other surface bodies of water; and drinking water wells listed in public record or otherwise known to CNX;
- Updated plugging and abandonment plan and cost estimate from an independent third-party contractor;
- Updated evidence of sufficient financial resources necessary to properly close, plug, and abandon the well, such as a surety bond or financial statement;
- More specific information on the specific gravity of the fluid used at the time the ISIP was obtained;
- Updated geologic information on the confining zone.

As we will consider any materials sent under this request as part of your application, please include a certification as required in 40 C.F.R. 144.32(d):

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant





PO Box 570
Pounding Mill, VA 24637

phone: 276-596-5137
robertstaton@cnx.com

September 10, 2018

Mr. James Bennett
U.S. EPA Region 3 Office
Ground Water & Enforcement Branch (3WP22)
Office of Drinking Water & Source Water Protection
1650 Arch Street
Philadelphia, PA 19103-2029


RE: UIC Permit Number VAS2D970BRUS (AW114ACV)

Dear Mr. Bennett;

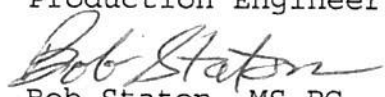
Please find enclosed a permit modification application for the above referenced UIC well in Russell County, Virginia. This modification request is to include additional injection zones to increase the well's overall effectiveness. Those zones are; Lower Maxon, and Big Lime. We have included geologic information regarding stimulation and breakdown pressures, formation correlation and depths, as well as a proposed construction diagram.

Please let us know if you require any additional information.

Sincerely,



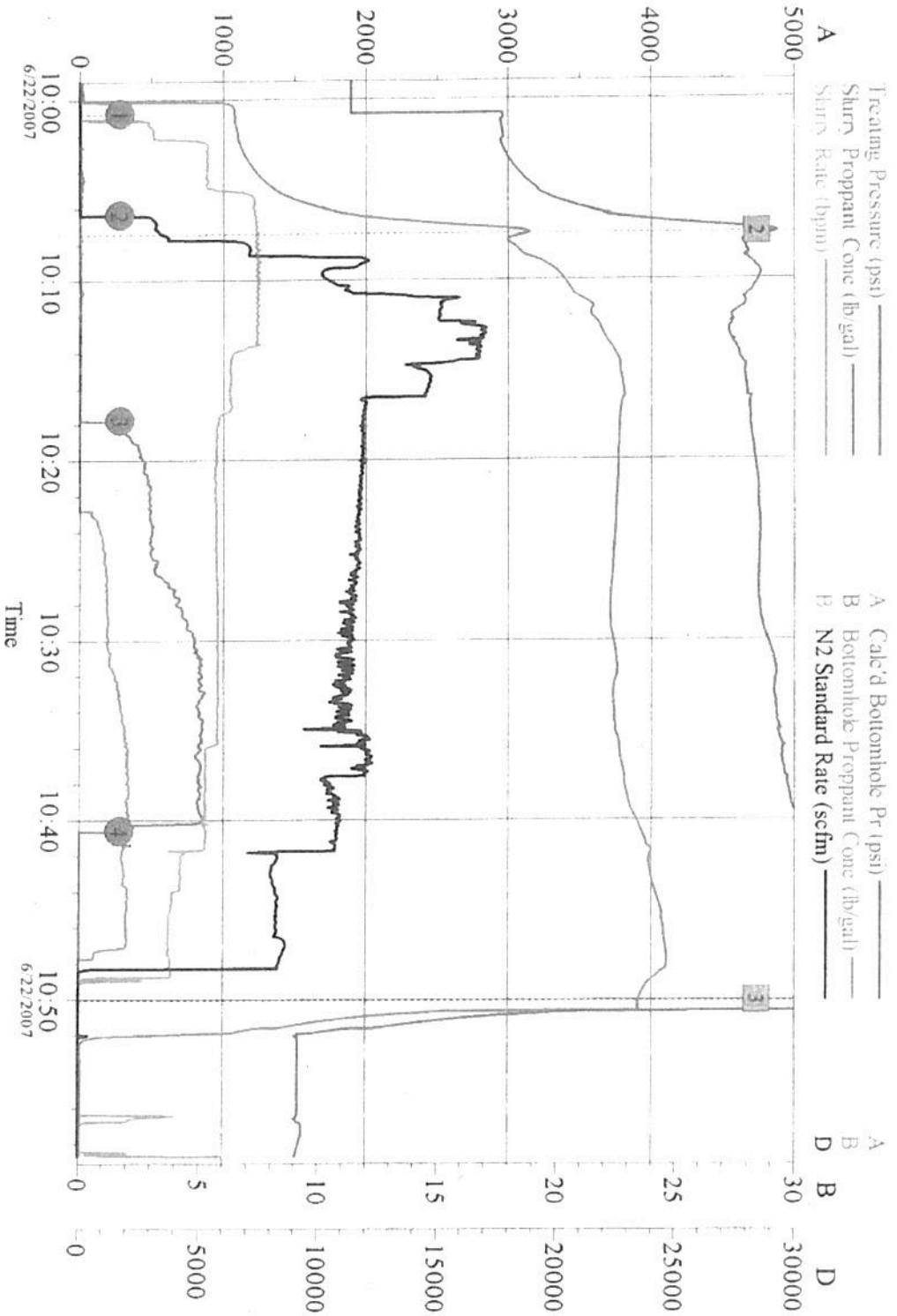
Andrew Statzer
Production Engineer



Bob Staton, MS PG
Permit Agent III

HALLIBURTON							
TICKET	5173030 / 5173031		PE DATA SHEET				
COMPANY	CNX GAS LLC	DATE	6/21/2007	WELL CODE	13	NAME	KELLY RING
WELL NO.	AW-114A	DAY OF WK	THUR	WELL TYPE	GAS	MBU NO	229160
LEASE	CNX	TIME ON LOC	11:00	JOB CODE	Foam Frac-275	CSG OD	5.50
FIELD	HONAKER	TIME OFF LOC	23:00			CSG WT	15.5
COUNTY	RUSSELL	HR ON LOC	12:00			TBG OD	
STATE	VA	HES ON LOC	21	TOTAL MHRS	252:00:00	TBG WT	
NO OF STGS	2	HHP ON LOC	1200	FRAC PLUGS	2		
BIG LIME MAXON						30,000	
	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	TOTALS	1 st Stage
FORMATION	GAS	GAS					
TOP PERF	4752.0	4318.0	0.0	0.0	0.0		
BOT PERF	4762.0	4334.0	0.0	0.0	0.0		
SHOTS/ FT	2	2					
MID PERF	4757	4326	0	0	0		
PLUGS @	4850	4,500					
PLUG/BAFFLE		BAFFLE	BAFFLE	PLUG			
PRE PAD	17	28	0	0	0		
PAD VOL	69	79	0	0	0		2 nd Stage
DELTA STAGE	NO	NO	NO	NO			
STIM FLUID	FOAM	FOAM	FOAM	FOAM			
TREAT VOL	-21	91	0	0	0	70	
CLEAN VOL	160	254	0	0	0	414	
DIRTY VOL	161	273	0	0	0	434	
DELTA FLUID	0	0	0	0	0	0	
FLUSH TYPE	H2O/ACID	H2O/ACID	H2O/ACID	H2O			
FLUSH VOL	113	103	0	0	0		
TOTAL CLN VOL	273	357	0	0	0	630	3rd Stage
N2 VOL	146,000	464,000	0	0	0	666,000	
COOLDOWN	28,000	28,000	0	0	0	56,000	
Perf Balls Used	0	0	0	0	0	0	
Foamer Type	SSO-21	SSO-21	SSO-21	SSO-21			
Flush Fluid Type	FLUSH	FLUSH					
Any Quick Flushes	NO	NO					
PROP NAME	SAND	SAND	SAND	SAND			
PROP SIZE	20/40	20/40	20/40	20/40			
PLACED	0	200	0	0	0	200	4 th Stage
DESIGNED	0	500	0	0	0	500	
PROP NAME	SAND	SAND	SAND	SAND			
PROP SIZE	12/20	12/20	12/20	12/20			
PLACED						0	
DESIGNED						0	
PROP FBK?							
MAX CONC		5.6	0	0	0		
Ave RATE	5.1	5.0	0	0	0	2.0	
BKDN PRES	4004	3152	0	0	0		5 th Stage
Ave PRES	2533	3840	0	0	0		
MAX PRES	4125	4114	0	0	0		
ISIP PRES	1860	3910	0	0	0		
5 MIN	N/A	N/A	N/A	N/A			
10 MIN	N/A	N/A	N/A	N/A			
FRAC GRAD	0.82	1.34	#DIV/0!	#DIV/0!	N/A		
Ave RTDOW HL	9.3	12	0	0	0	4.3	
Max DH Sand Conc	0	2	0	0	0		
CUST INDEX			0	0	0		
MECH BKD	NO	NO					Gen Comments
SAFETY INC	NO	NO					
ENV INC	NO	NO					
START TIME	17:51	10:00	0:00	0:00	0:00		
END TIME	19:18	10:50	0:00	0:00	0:00		
JOB TIME	1:27	0:50	0:00	0:00	0:00	2:17	
PUMP TIME	1:27	0:50	0:00	0:00	0:00	2:17	
HC-2	15	31	0	0	0	46	
LGC-35	15	30	0	0	0	45	
GBVW-30	1	17	0	0	0	18	
FERCHEK	0	0	0	0	0	0	
Cla-Fix II	9	22	0	0	0	31	
ACID	4000	0	0	0	0	4,000	
HAI-OS	4	0	0	0	0	4	
BE-3S	1	1	0	0	0	2	
PERF BALLS	0	0	0	0	0	0	
GAS PERM	11	19				30	
						0	
						0	
						0	
						0	

CNX AW-114A STAGE 2 MAXON



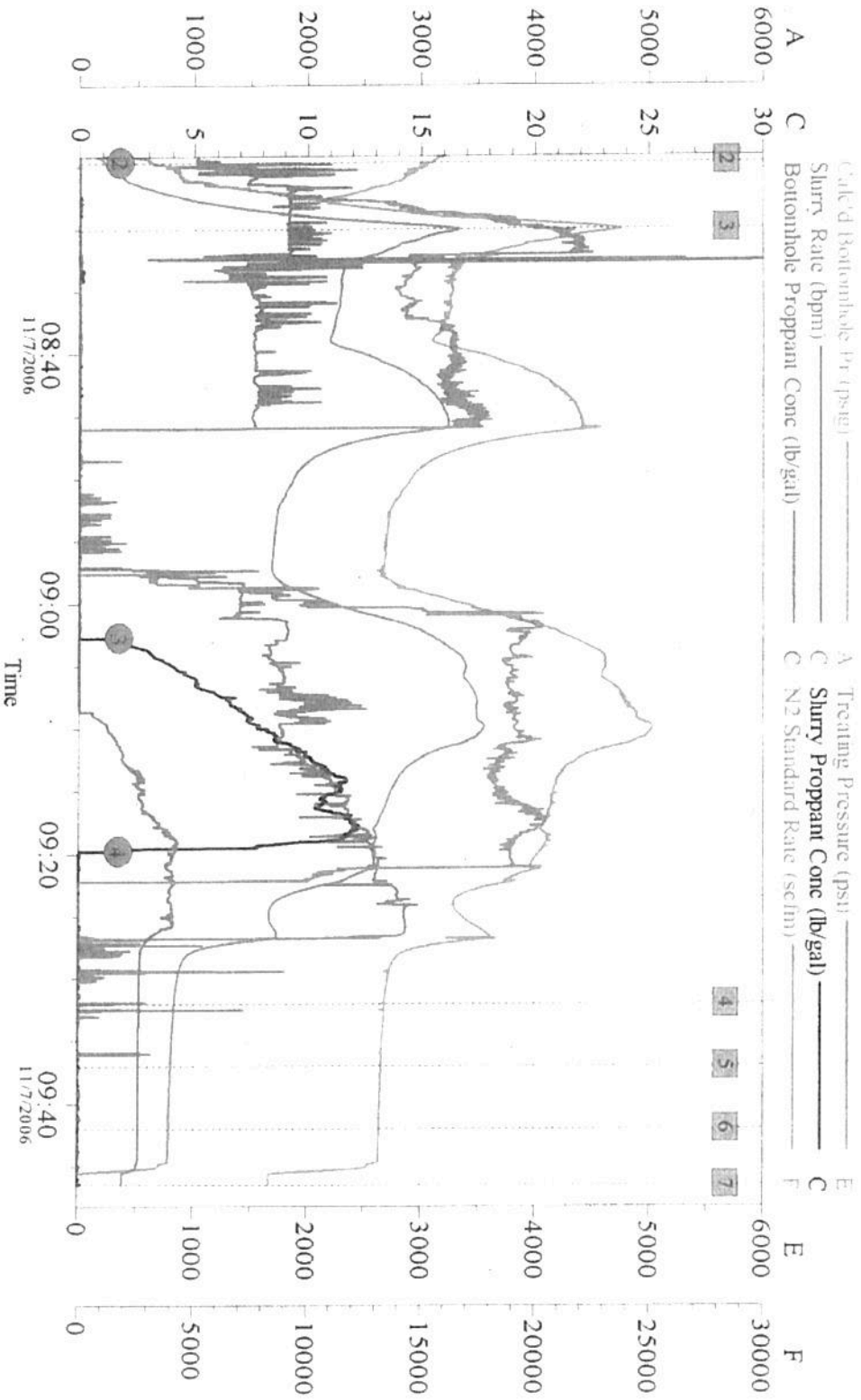
Customer: CNX
Well Description: CNX AW-114A

Job Date: 22-Jun-2007
UWI:

Sales Order #: 5173030 / 5173031

INSITE for Simulation v2.3.1
22-Mar-07 11:00

CNX AW 114-A STAGE 1 WEIR

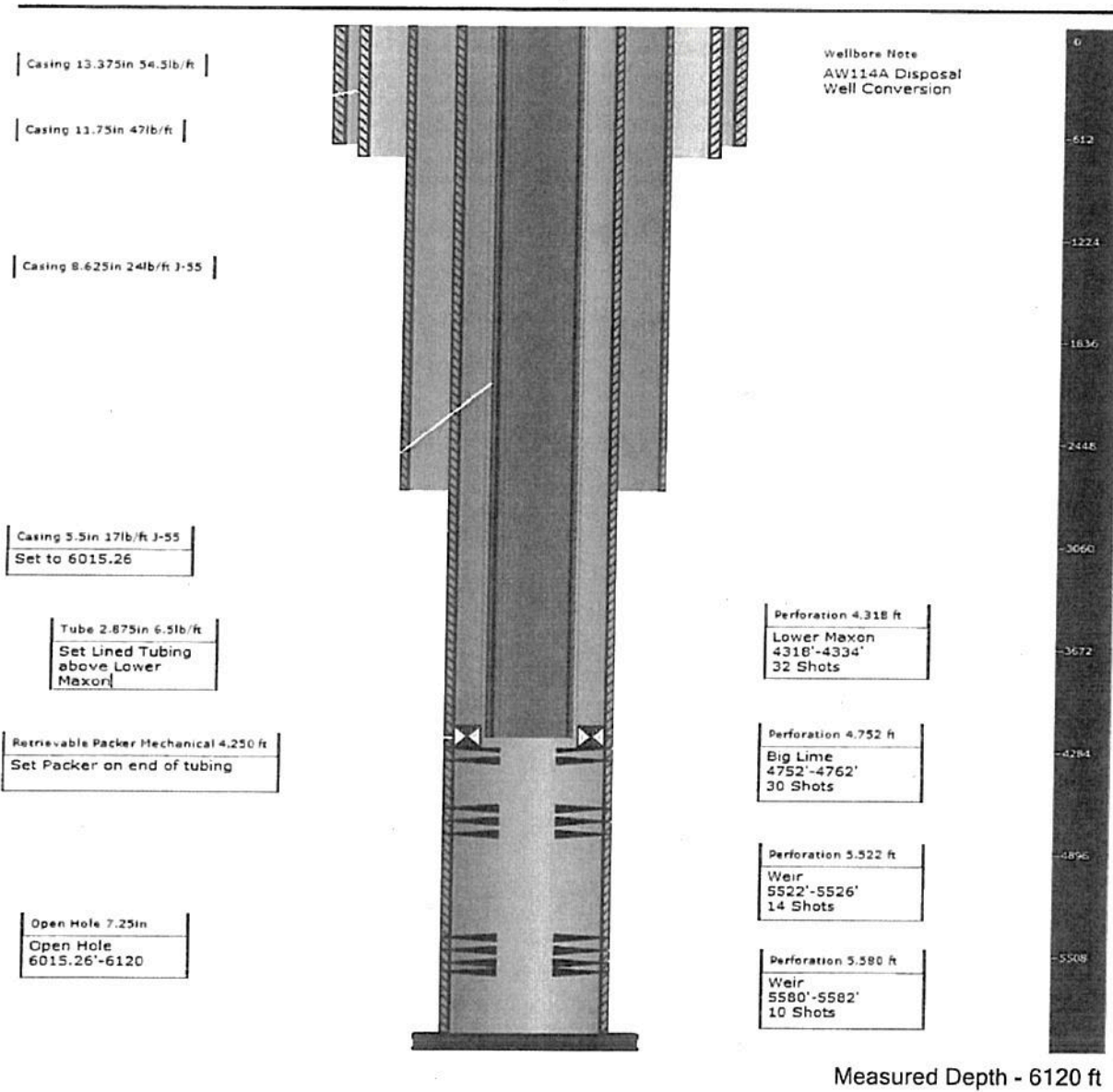


Customer: CNX GAS LLC
Well Description: CNX AW-114A

Job Date: 07-Nov-2006
LWT:

Sales Order #: 4728085 / 4728087

INSITE for Simulation v2.4 (p)
07-Nov-06 09:52



Legend:

-  Open Hole
-  Tubing
-  Retrievable Packer Mechanical
-  Casing
-  Perforation



PO Box 570
Pounding Mill, VA 24637

phone: 276-596-5137
robertstaton@cnx.com

December 6, 2018

Ms. Jill Branby
U.S. EPA Region 3 Office
Ground Water & Enforcement Branch (3WP22)
Office of Drinking Water & Source Water Protection
1650 Arch Street
Philadelphia, PA 19103-2029

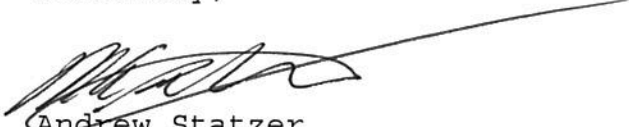
RE: UIC Permit Number VAS2D970BRUS (AW114ACV)

Dear Ms. Branby;

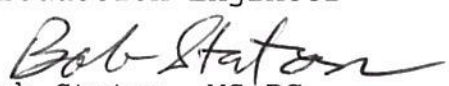
In response to your instructions regarding the modification request, please find the following:

Please let us know if you require any additional information.

Sincerely,



Andrew Statzer
Production Engineer



Bob Staton, MS PG
Permit Agent III



Hereby submits this

Underground Injection Control
Request for Modification

Permit ID VAS2D970BRUS
Well Number AW114ACV

U.S. EPA Region 3
Russell County, Virginia

LIST OF EXHIBITS

Request for Modification

APPENDICIES

1. Area of Review Map
2. Well construction diagram and description
3. Plugging and abandonment plan and cost estimate
4. Specific gravity calculation of fracture fluid
5. Sufficient financial surety bond
6. Certification statement

Request for Modification

CNX Gas Company LLC hereby requests to modify existing permit number VAS2D970BRUS (AW1141CV) for additional injection zones in the Lower Maxon sandstone and the Big Lime limestone. These additional zones are needed due to the failure of the casing above the Weir sandstone. The casing was found to be competent above the Maxon sandstone. Therefore, we propose to use the upper formations for injection. This will also allow for a greater injection volume for proper disposal of our produced fluids. Produced fluids will be transported to the injection well site, stored in above-ground storage tanks, filtered and introduced into the injection zones. The injection process will be monitoring by trained personnel. The following should fulfill your request for additional information regarding this modification request.

Area of Review

An update of the Area of Review did not find any new wells; intakes or discharges; hazardous waste treatment, storage or disposal facilities; wells, springs, or other surface bodies of water; nor drinking water wells (see appendix 1).

Well Construction Diagram and Description

A diagram of the proposed well construction shows the perforated zones including the Lower Maxon, 4318'-4334', and Big Lime, 4752'-4762'. A retrievable mechanical packer will be set at 4,250 feet from the surface at the end of the tubing. The tubing will be 2.875 inch diameter and extend down the well to a point approximately 68' above the Lower Maxon (see appendix 2).

Plugging and Abandonment

A plugging and abandonment plan and cost estimate was developed by Skyline Contracting, Inc. (see appendix 3).

Specific Gravity Calculation

The specific gravity (S.G.) of the fracturing fluid was not made available at the time of the frac procedure. However, we have manually calculated the value based on the chemical components that were used during the procedure. The calculated S.G. of the fluid for the Lower Maxon is 1.04107. The calculated S.G. of the fluid for the Big Lime is 1.0522 (see appendix 4).

Confining Zone

The injection zone for the Maxon sands are a mixture of sandstone interbedded with shale/siltstone. The shales/siltstones that are interbedded with the sandstone are considered to have low permeability and deemed a confining zone above the Lower Maxon. The Big Lime interval will be injected into a more porous oolitic zone capped by a denser limestone considered to be of low permeability. These rocks are overlain by competent and dense quartz arenites in the Pocahontas Formation that lies approximately 2,000 above the Lower Maxon, and 2,200 feet below the surface. This sequence provides structural competence and permeability barriers that will limit the potential upward migration of fluids. No known faults are in close proximity of the injection area that would allow movement of fluids.

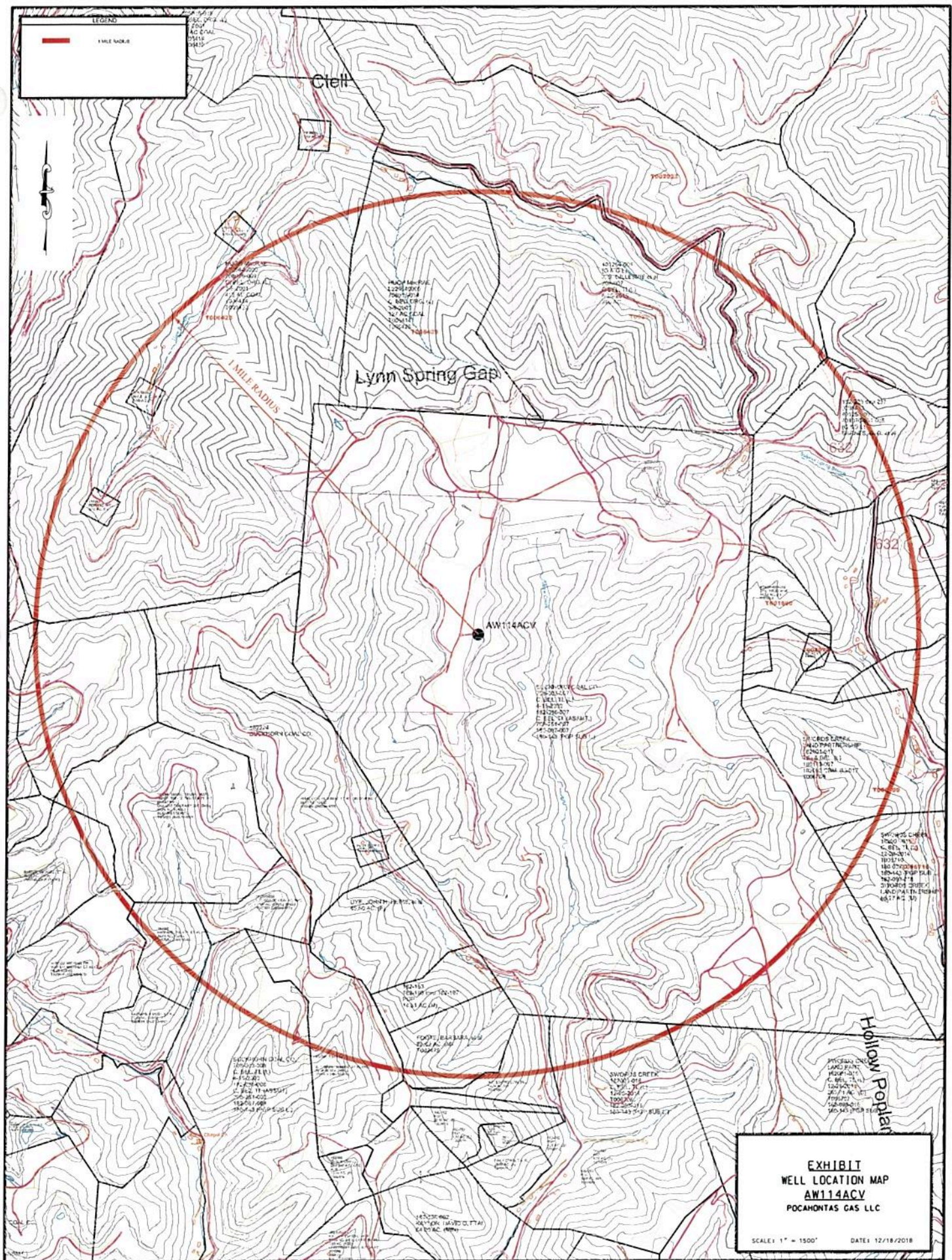
Financial Surety Bond

A copy of our surety bond is in appendix 6.

Certification Statement

Our certification statement, with signature, is in appendix 7.

APPENDIX 1



APPENDIX 2

Casing 13.375in 54.5lb/ft

Casing 11.75in 47lb/ft

Casing 8.625in 24lb/ft J-55

Casing 5.5in 17lb/ft J-55
Set to 6015.26

Tube 2.875in 6.5lb/ft
Set Lined Tubing
above Lower
Maxon

Retrievable Packer Mechanical 4,250 ft
Set Packer on end of tubing

Open Hole 7.25in
Open Hole
6015.26'-6120

Wellbore Note
AW114A Disposal
Well Conversion

Perforation 4,318 ft
Lower Maxon
4318'-4334'
32 Shots

Perforation 4,752 ft
Big Lime
4752'-4762'
30 Shots

Perforation 5,522 ft
Weir
5522'-5526'
14 Shots

Perforation 5,580 ft
Weir
5580'-5582'
10 Shots

0
-612
-1224
-1836
-2448
-3060
-3672
-4284
-4896
-5508

Measured Depth - 6120 ft

Legend:

Open Hole

Tubing

Retrievable Packer Mechanical

Casing

Perforation

APPENDIX 3

Skyline Contracting Inc.
PO Box 663
Oakwood, VA 24631
(276) 498-3560

CNX Resources LLC.
1000 Consol Energy Drive
Canonsburg, PA 15317

RE: Well plugging Proposal
Well #: AW-114A

Dec. 12, 2018

Mr. Statzer,

We are pleased to present the following proposal for your consideration. If you have questions please feel free to call on us at any time.

Scope of Work:

1. Move service rig on location and rig up, release packer and pull 2 7/8" tubing, establish well total depth.
Total Cost: \$4,575.00
2. Trip tubing in hole to established TD and set cement plug (Class A 3% CACL 1#/sk) from TD to approximately 2780'; pull all tubing out of hole.
Total Cost: \$14,287.87
3. Tag bottom plug.
Total Cost: \$695.00
4. Cut 5 1/2" casing @ 2770'; pull casing from well.
Total Cost: \$9,985.00
5. Trip in tubing to 2780' and pump Class A Neat cement plug from 2780' to surface, install permanent well plugging monument; pull all tubing; install permanent well plugging monument, rig down service rig.
Total Cost: \$31,675.55
6. Move all equipment, tubing, and casing off of location.
Total Cost: \$1575.00

Total Plugging Cost for this well:

\$62,793.42

Please find attached a copy of the wellbore schematic.

Regards,

Kenneth Horne, Pres.
Skyline Contracting Inc.

APPENDIX 4

The calculated specific gravity was 1.05 with a foam quality of 70%

The second stage of the frac was on the Lower Maxon at an interval of 4318.0'-4734.0' consisting of the following component and corresponding specific gravity.

Stage 2 Lower Maxon				
Chemical Used	Description	Specific Gravity	QTY (gal.)	Total Weight
HC-2	Surfactant	1.12	31	289.7384
LGC-35	Gelling Agent	1.12	30	280.392
GBW-30	Breaker	1.5	17	212.7975
Cla-Fix II	Clay Control	1.035	22	190.01565
HAI-OS	Corrosion Inhibitor	0.89	0	0
BE-3S	Bactericide	2.2	1	18.359
GAS PERM	Surfactant	0.926	19	146.82193
Water	Produced Water Scale Inhibitor	1.04	10668	92585.4384
			10788	93723.56288
		Specific Gravity of Fluid		1.041073786

The calculated specific gravity was 1.04 with a foam quality of 70%

The water used in both stages was a mixture of produced water and scale inhibitor. The produced water normally comes from several locations. The specific gravity was obtained from the testing that we conduct at our existing disposal well quarterly.

Water				
Chemical Used	Description	Specific Gravity	QTY (gal.)	Total Weight (lbs.)
Water	Produced Water	1.04	17388	150906.9744
LP-65	Scale Inhibitor	1.179	31	305.001405
			17419	151211.9758
			Specific Gravity	1.040247374

Only a partial amount of the water on site was used during the frac.

All of the specific gravity information of the components was obtained from the Haliburton SDS.

Chemical Used	Description	Specific Gravity	QTY (gal.)	Total Weight (lbs)
Water	Produced Water	1.04	17388	150906.9744
LP-65	Scale Inhibitor	1.179	31	305.001405
			17419	151211.9758
			Specific Gravity	1.040247374

The following is a summary of the geologic and physical characteristics of the proposed injection zones.

Big Lime 4752.0 - 4762.0

Breakdown Pres	4004 psi
Ave. Pres	2533 psi
Max. Pres	4125 psi
ISIP Pres	1860 psi
Frac Gradient	.82 psi/ft

Lower Maxon 4318.0-4334.0

Breakdown Pres	3152 psi
Ave. Pres	3840 psi
Max. Pres	4114
ISIP Pres	3910
Frac Gradient	1.34

APPENDIX 5



P.O. Box 3967
Peoria IL 61612-3967
Phone: 309-692-1000 Fax: 309-683-1610

POWER OF ATTORNEY

RLI Insurance Company Contractors Bonding and Insurance Company

Bond No. CMS227326

Know All Men by These Presents:

That this Power of Attorney is not valid or in effect unless attached to the bond which it authorizes, but may be detached by the approving officer if desired.

That this Power of Attorney may be effective and given to either or both of **RLI Insurance Company** and **Contractors Bonding and Insurance Company**, required for the applicable bond.

That **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, each Illinois corporations (as applicable), each authorized and licensed to do business in all states and the District of Columbia do hereby make, constitute and appoint:

Sandra L. Ham in the City of St. Louis, State of Missouri,
as Attorney in Fact, with full power and authority hereby conferred upon him/her to sign, execute, acknowledge and deliver for and on its behalf as Surety, in general, any and all bonds, undertakings, and recognizances in an amount not to exceed Twenty Five Million Dollars (\$25,000,000) for any single obligation, and specifically for the following described bond.

Principal: Pocahontas Gas LLC

Obligee: Commonwealth of Virginia Department of Transportation

RLI Insurance Company and **Contractors Bonding and Insurance Company**, as applicable, have each further certified that the following is a true and exact copy of a Resolution adopted by the Board of Directors of each such corporation, and now in force, to-wit:

"All bonds, policies, undertakings, Powers of Attorney or other obligations of the Corporation shall be executed in the corporate name of the Corporation by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or Agents who shall have authority to issue bonds, policies or undertakings in the name of the Corporation. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the Corporation. The signature of any such officer and the corporate seal may be printed by facsimile or other electronic image."

IN WITNESS WHEREOF, **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have caused these presents to be executed by its respective Vice President with its corporate seal affixed this 09th day of October, 2017.

ATTEST:

Cherie L. Montgomery
Cherie L. Montgomery Assistant Secretary



RLI Insurance Company
Contractors Bonding and Insurance Company
B. W. Davis
Barton W. Davis Vice President

On this 09th day of October, 2017 before me, a Notary Public, personally appeared Barton W. Davis and Cherie L. Montgomery, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as Vice President and Assistant Secretary, respectively, of **RLI Insurance Company** and **Contractors Bonding and Insurance Company**, and acknowledged said instrument to be the voluntary act and deed of said corporation.

Jacqueline M. Bockler
Jacqueline M. Bockler Notary Public



ACKNOWLEDGMENT BY SURETY

STATE
OF Missouri }
City of St. Louis } ss.

On this 09th day of October, 2017, before me personally
appeared Sandra L. Ham, known to me to be the Attorney-in-Fact of
RLI Insurance Company

_____, the corporation
that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid
County, the day and year in this certificate first above written.

My Commission Expires: September 16, 2019

(Seal)

Brittany D. Clavin

Brittany D. Clavin
Notary Public in the State of Missouri
County of St. Louis
Commission # 15638336



SURETY RIDER

To be attached to and form a part of

Bond No. CMS227326

dated 1/19/2006
effective
(MONTH-DAY-YEAR)

executed by CNX GAS COMPANY LLC
(PRINCIPAL)

, as Principal,

and by RLI Insurance Company

, as Surety,

in favor of Commonwealth of Virginia Department of Transportation
(OBLIGEE)

in consideration of the mutual agreements herein contained the Principal and the Surety hereby consent to changing

The Principal name from: CNX GAS COMPANY LLC

To: Pocahontas Gas LLC

Nothing herein contained shall vary, alter or extend any provision or condition of this bond except as herein expressly stated.

This rider
is effective 10/9/2017
(MONTH-DAY-YEAR)

Signed and Sealed 10/9/2017
(MONTH-DAY-YEAR)

Pocahontas Gas LLC
(PRINCIPAL)

By: 
(PRINCIPAL) Stephen W. Johnson, Sr. Vice President

RLI Insurance Company
(SURETY)

By: 
Sandra L. Ham, Attorney-in-Fact

APPENDIX 6



CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Mary Beth McGlothlin

Date: 12-19-18

Title: Asst. Vice President

Phone No. 276-596-5009

Signature: Mary Beth McGlothlin



This certification statement is being submitted as an addendum to a letter to Mr. James Bennett, dated September 10, 2018, in reference to UIC Permit No. VAS2D970BRUS

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Mary Beth McGlothlin

Date: 12-19-18

Title: Asst. Vice President

Phone No. 276-596-5009

Signature: Mary Beth McGlothlin